Journal of Physical Education and Sport ®(JPES),Vol 21 (Suppl. issue 2), Art 146 pp 1156 – 1164, Apr. 2021
online ISSN: 2247 - 806X; p-ISSN: 2247 – 8051; ISSN - L = 2247 - 8051 © JPES

Original Article

Balancing mass sports participation and elite sports performance: heterogeneity of the EU countries

KAROLINA NESSEL
Faculty of Management and Social Communication, Jagiellonian University in Kraków, POLAND

Published online: April 30, 2021
(Accepted for publication April 15, 2021)
DOI:10.7752/jpes.2021.s2146

Abstract
Background: Despite the positive interdependence between mass and elite sports performance assumed in many official policy statements, even wealthy countries are faced with a dilemma of priorities in their sport policy, balancing needs for a high participation in sports for all (to reduce health and social risks) with a desire for a success in the Olympic Games (to improve national pride and international recognition of a country brand). **Purpose**: The main aim of this research was to investigate the heterogeneity of the EU countries in terms of their mass sports participation and elite sports achievements. Its secondary aim was to explore the potential correlates of this heterogeneity. **Material and methods:** A hierarchical and a K-means clustering methods were used to determine groupings of the EU countries according to their sports participation and Olympic results in four time periods: 2004/6, 2008/10, 2012/14, 2016/18. Additionally, profiling of the clusters with a set of potential correlates was conducted. **Results:** Four main clusters were identified: low sporting performance countries, mass sports-focused countries, elite sports-focused countries, high sporting performance countries, completed with a fifth, unsteady cluster of outstanding elite sports performance countries. The mass sports participation is higher in clusters with relatively superior living standards and income, better sporting opportunities, higher public sport expenditure, and higher household spending on sports. In contrast, higher elite sports success requires not only good sporting opportunities, but is also dependent on the public financial support. There is more variance in elite sports than in mass sports achievements, both across countries and over time. **Conclusions:** There are important differences in sporting profiles of the EU countries. The countries having achieved very high rates of sports participation seem to face a trade-off between a hazardous Olympic success and an even higher, but stable, mass participation in sports.
Keywords: physical activity, sport for all, comparative, sport policy, segmenation

Introduction

Sport has made its place in national policy agendas in most countries. In the European Union not only the majority of member countries have their strategies for sport (Christiansen et al., 2014), but also the European Commission is involved in shaping the environment for sport activities (García et al., 2018). On the national level two overarching policy goals are usually presented: enhancing an active participation of the population in sports, and rising the quality of elite sports performance(Green, 2009). In both cases, sport is considered to deliver wider social goals for government. In particular, intensifying mass participation in sports is hoped to foster social inclusion, crime prevention, urban regeneration, educational attainment, and – last but not least – healthrisks reduction (Crosnoe, 2002; Houlihan, 1997). Public investment in high performance sport, on the other hand, is usually legitimised on the basis that successes in elite sports produce such virtuous outcomes as "feel good effect" and enhanced national pride, positive national image abroad, and promotion of sports participation among citizens (Grix & Carmichael, 2012; Houlihan & Green, 2008). The last argument is based on the demonstration effect that makes people inspired enough by elite sports, athletes or sporting events to undertake their own participation in sports (Weed et al., 2015).

In fact, according to the pyramid model of sport development, mass sports participation and elite sports are positively interrelated: spectacular achievements in high performance sports are believed to trickle down to the bottom of the sport pyramid and enhance the mass participation in sports through the demonstration effect, whereas a high participation in sports provides a positive breeding ground for elite sports (Green, 2005). Hence, the twin objectives of sport policy, i.e. supporting both participation in sports for all and elite sport performance, are usually considered complementary and non-rival, notably in official policy statements. This logical vision is, however, challenged at least on two grounds: the lack of clear statistical evidence of the trickle-down effect, and practical issues of simultaneous realisation of both goals.

The evidence for the sporting success triggering the trickle-down effect is mixed at best (Frick & Wicker, 2015; Grix & Carmichael, 2012). Even if a positive relationship between elite sports performance and

Corresponding Author: KAROLINA NESSEL, E-mail: karolina.nessel@uj.edu.pl

mass sports participation is found in some analyses (Frawley & Cush, 2011; Hanstad & Skille, 2010), in most cases no correlation, or even a negative one, is shown (Feddersen et al., 2009; Veal et al., 2012). Other research suggests that the trickle-down effect may eventually work only under some very specific conditions, defined by the discipline, athletes' gender, sporting event, etc. (De Bosscher et al., 2011, 2013; Frick & Wicker, 2015).

As the positive, long-lasting, consistent, and inherent impact of elite sport success on mass sports participation is seriously questioned, a sensitive issue of rivalry of both sport policy goals arises. In practice, the amount of resources available for sport development is usually limited, and even wealthy countries face a dilemma of their sport policy goals prioritization – if not for financial, then for societal legitimisation reasons (Ronglan, 2015). The issue is becoming even more sensitive as more nations engage in the battle for Olympic success, while the supply of medals remains essentially fixed. The global sporting arms race, as Oakley and Green (2001) called it, requires, therefore, increases in elite sport public investments if a country merely wishesto maintain its competitive position and standing (De Bosscher et al., 2011). But the problem lies not merely in a rival access to resources (finance, infrastructure, coaching) of both forms of sport involvement. There are also some other touchy issues, like early talent selection and intensive specialisation, exposure to the competition pressures, or professionalisation of sport delivery – what nowadays is a must for a top performance success seems contrary to the idea of grassroots sport in many countries (van Bottenburg, 2002). The intensification processes in elite sport developments – performance focusing, result optimisation and resource mobilisation (Sjöblom & Fahlén, 2010) – have made the two worlds of mass and elite sports grow apart. In many countries, both forms of sports move today on their own, parallel tracks, with different management structures, separate systems and programmes, and dedicated public budgets. Worse still, it is not uncommon to find opinions that both forms of sports have become incompatible, even contradictory in nature (Collins et al., 2012).

The ongoing divergence between the mass and elite sports worlds leads to rising tensions between the twin goals of sport policy (Houlihan & Green, 2008; Houlihan & White, 2002; van Bottenburg, 2002). In some countries (e.g., Russia, China, South Korea) their sport policy has been performance-oriented for many decencies. In many others (e.g., Canada, Australia), after a long period of mass sports participation dominance, the rhetoric and funding shifted towards elite sports around 20 years ago. Some other nations' twist towards top performance is a relatively more recent phenomenon (e.g., the UK) On the other hand, there are still countries clearly prioritising the bottom of the sporting pyramid, in spite of pressures from elite sports' stakeholders (e.g., Norway, Finland, Brazil).

And what is the situation in this regard in the EU member countries? How do they balance their mass and elite sports goals? A comprehensive answer to these questions should involve a comparison of public budget allocations on mass and elite sports. This kind of analysis is, however, limited by the inaccessibility of the data for all EU countries and often limited to bilateral or regional comparisons and case studies (De Bosscher et al., 2015). Therefore, in this study the performance in both areas is assumed revelatory of national sport policy goals. In fact, also in this respect no single large cross national comparison of both sport dimensions simultaneously is found in the current research. Consequently, the main aim of the study is to give a clear picture of the heterogeneity of the EU countries in terms of their achievements in both forms of sport involvement: mass sports participation and elite sports performance. The idea is to determine clusters of similar EU countries regarding both sport policy outcomes. Moreover, a time perspective is added, with the analysis conducted for four time periods over the time span 2004-2018.

Materials & methods

Data analysis framework

Data analysis consisted of four stages: 1) exploration of the data, 2) clustering of the countries in each of the four time periods, 3) determination of the general classification, 4) profiling of the clusters in terms of some possible correlates.

Data and measurements

The clustering of the countries was based on their mass sports participation and elite sport success. Elite sports success (ES) was measured with the medal points: each gold medal is worth 3 points, a silver one – 2 points, and a bronze one – 1 point (following De Bosscher et al., 2008). The points gained at consecutive Summer and Winter Olympic Games were divided by the country's population in millions and summed. The medal counts were sourced from the International Olympic Committee website and the population size from Eurostat (2019c). The mass sports participation (MS) was measured with the participation points (following Nessel & Kościółek, 2020). The measurement pooled shares of adult population exercising or playing sport with different regularity multiplied by the following points: regularity of 3 times a week or more – 3 points, 1–2 times a week – 2 points, 1–3 times a month – 1 point. Sport participation was sourced from Eurobarometer surveys published by the European Commission.

The research also followed Nessel and Kościółek (2020) in the formulation of the four time periods for the analysis (with the objective to minimise the time between Olympic Games and the sport participation surveys):

1. 2004/06: 2004 Summer Olympics in Athens, 2006 Winter Olympics in Turin, the Eurobarometer 213 (fieldwork: 2004 –European Commission, 2004),
2. 2008/10: 2008 Summer Olympics in Beijing, 2010 Winter Olympics in Vancouver, the Eurobarometer 334 (fieldwork: 2009 –European Commission, 2010),
3. 2012/14: 2012 Summer Olympics in London, 2014 Winter Olympics in Sochi, the Eurobarometer 412 (fieldwork: 2013 – European Commission, 2014),
4. 2016/18: 2016 Summer Olympics in Rio de Janeiro, 2018 Winter Olympics in Pyeongchang, the Eurobarometer 472 (fieldwork: 2017 – European Commission, 2018).

The profiling of the general clusters was made on the basis of chosen variables concerning the latest time period – 2016/18. Three variables related to the economic, social and demographic stance of the country, which is often found to influence the sporting participation and Olympic medals (Downward et al., 2014; Scelles et al., 2020): 1) Gross Domestic Income per capita in Purchasing Power Parity (GDI) in 2017; 2) inequality adjusted Human Development Index (iHDI) in 2017; 3) old-age (65 and older) dependency ratio (DEP) in 2017. All three indices were sourced from UNDP (2021). Additionally, three sport-related measures were used: 1) general government sporting on recreational and sporting services (PSE) from Eurostat (2019a), converted to 2011 international dollars using Purchasing Power Parities for GDP (World Bank, 2019), divided by the population, and averaged over the five years 2012-2017; 2) mean household consumption expenditure on sporting goods and services (HSE) in Purchasing Power Standard in 2015 (with the approximation for the year 2015 in the case of Denmark, France, Portugal, and the UK based on their results for 2010 and the geometric average change for other EU countries between 2010 and 2015) from Eurostat (2019b); 3) quality of sporting opportunities (SO) in 2017 defined as an average of respondents agreeing with the two following statements in the Eurobarometer survey: i) "The area where you live offers you many opportunities to be physically active", ii) "Local sports clubs and other local providers offer many opportunities to be physically active" (European Commission, 2018).

Research covered all countries belonging to the European Union during the four time periods (and hence with Bulgaria and Romania entering the segmentation in 2008/10, and Croatia in 2012/14). Table 1 presents the summary of the data.

Table 1. Summary of the data

Variable	Unit	Year	Min	Max	Median	Mean	SD	CV
MS (mass sports participation)	participation points	2004/06	0.52	2.04	1.02	1.06	0.38	0.36
		2008/10	0.36	1.96	1.09	1.10	0.41	0.37
		2012/14	0.33	1.83	1.07	1.09	0.37	0.34
		2016/18	0.42	1.86	0.97	1.05	0.38	0.36
		total	0.33	2.04	1.04	1.07	0.38	0.36
ES (elite sports performance)	medal points per million citizens	2004/06	0.00	9.59	2.11	2.44	2.22	0.91
		2008/10	0.00	6.92	1.90	2.11	1.68	0.80
		2012/14	0.00	10.20	2.11	2.40	2.13	0.89
		2016/18	0.00	5.58	1.44	2.01	1.77	0.88
		total	0.00	10.20	1.89	2.24	1.97	0.88
GDI (gross domestic income)	2011 international $ per capita in thous.	2017	20.85	72.75	37.22	40.85	12.59	0.31
iHDI (inequality adjusted Human Development Index)	0-1	2017	0.71	0.87	0.80	0.80	0.05	0.06
DEP (old-age dependency ratio)	65+ per 100 people ages 15-64	2017	19.20	35.10	29.15	28.87	4.09	0.14
PSE (public sport expenditure)	2011 international $ per capita	2012-17 average	22.00	466.56	96.47	124.20	88.85	0.72
HSE (mean household sport expenditure)	PPS per household	2015	10.90	703.30	300.35	317.85	217.38	0.68
SO (sporting opportunities)	average percentage of respondents	2017	0.31	0.95	0.73	0.72	0.15	0.22

Data analysis

Segmentation in each of the four time periods was done in the two-step approach. First, the number of segments was approximated with the use of the Ward's method (an agglomerative procedure). Next, the K-means method (a non-hierarchical procedure) was applied (with centroids set to maximise the Euclidian distance between them). In the latter step, the number of clusters was guided by the results of the Ward's method and the interpretability potential in the research context. To give both variables (ES and MS) the same weight in clustering their Z-score normalisation was conducted prior to the clustering (with the averages and standard

deviations set for the pooled four time periods). In addition, the initial exploration of ES and MS showed that their correlation is weak (Pearson's r of .20), so there is no issue of multicollinearity and the clustering could be applied.

Profiling of the clusters was based on descriptive statistics without statistical tests as the data analysis concerned the whole population of the EU countries (and not a sample of it).

Results

Figure 1 depicts the clustering results for each time period separately. In the initial period, 2004/06, six clusters could be delimited mainly upon their relation to the average ES and MS values: Cluster 1 – low sporting performance countries (low ES, low MS), Cluster 2 – elite sports-focused countries (high ES, low ES), Cluster 3 – mass sports-focused countries (low ES, high MS), Cluster 4 – high sporting performance countries (high ES, high MS), Cluster 5 – outstanding elite sports performance countries (very high MS), and Cluster 6 – outstanding mass sports performance countries (high ES, very high MS). With time, the initial Cluster 4 and Cluster 6 merged, while Cluster 5 turned out to vary considerably (changing structure and disappearing in the most recent time period).

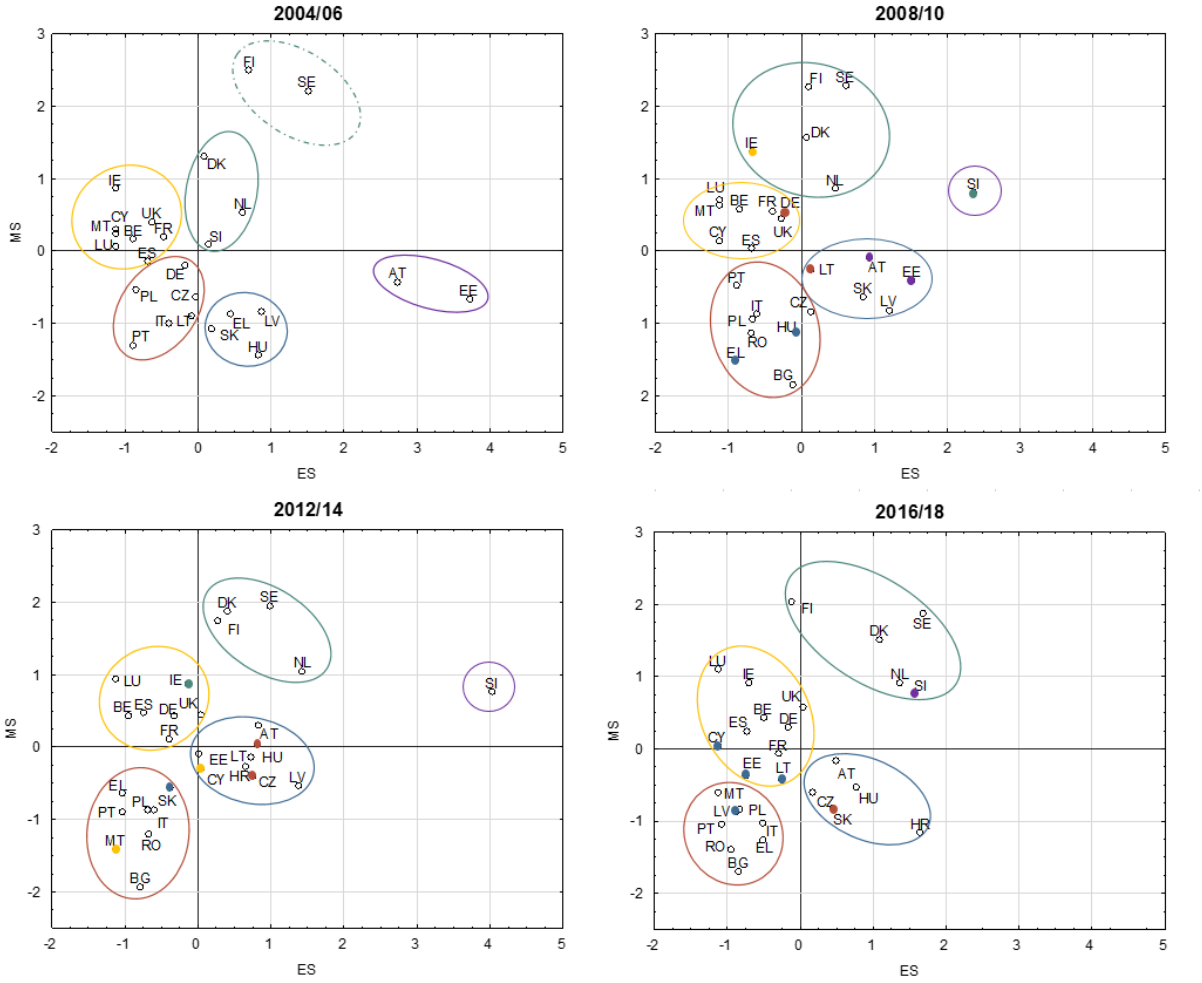

Figure 1. Clusters in individual time periods: 2004/6, 2008/10, 2021/14, 2016/18

Note:Colour of a marker indicates membership of the country in another cluster (of the given colour) in the previous time period.

With the exception of the unsteady Cluster 5 (outstanding elite sports performance) and the disappeared Cluster 6 (outstanding mass sports performance) other clusters seem quite stable (Table. 2). In the last two time periods no more than 22% of the countries moved between the clusters, and most of the countries either stayed in the same clusters during all four periods, or at least three periods. Only two countries show more irregular patterns: Estonia (clusters order: 5, 2, 2, 3), and Lithuania (clusters order: 1, 2, 2, 3). Moreover, two definitive transfers seem to have happened in the case of Czech Republic (having moved from the cluster of low sporting performance to the cluster of elite sports focus) and Malta (having moved from mass sports-focused countries into low sporting performance cluster).

Table 2. Cluster membership in the four time periods and the general clustering

	2004/06	2008/10	2012/14	2016/18	GENERAL		2004/06	2008/10	2012/14	2016/18	GENERAL
Austria	1	2	2	2	2	Italy	1	1	1	1	1
Belgium	3	3	3	3	3	Latvia	2	2	2	1	2
Bulgaria	-	1	1	1	1	Lithuania	1	2	2	3	2
Croatia	-	-	2	2	2	Luxembourg	3	3	3	3	3
Cyprus	3	2	3	3	3	Malta	3	3	1	1	1
Czech Republic	1	1	2	2	2	Netherlands	4	4	4	4	4
Denmark	4	4	4	4	4	Poland	1	1	1	1	1
Estonia	1	2	2	3	2	Portugal	1	1	1	1	1
Finland	6	4	4	4	4	Romania	-	1	1	1	1
France	3	3	3	3	3	Slovakia	2	2	1	2	2
Germany	1	3	3	3	3	Slovenia	4	5	5	4	4
Greece	2	1	1	1	1	Spain	3	3	3	3	3
Hungary	2	1	2	2	2	Sweden	6	4	4	4	4
Ireland	3	3	3	3	3	United Kingdom	3	3	3	3	3

Notes: 1 – Cluster 1 (low ES, low MS), 2 – Cluster 2 (high MS, low ES), 3 – Cluster 3 (low EW, high MS), 4 – Cluster 4 (high ES, high MS), 5 – Cluster 5 (very high ES, high MS), 6 – Cluster 6 (high ES, very high MS)

Based on the latest clustering results or the dominant cluster membership in the previous periods a general clustering of the 28 EU countries into four main clusters is proposed (Table 2, Figure 2):

- Cluster 1: low sporting performance (low ES, low MS – 7 countries: BG, EL, IT, MT, PL, PT, RO),
- Cluster 2: elite sports focus (high ES, low MS – 8 countries: AT, CZ, EE,HR, HU, SK, LT, LV),
- Cluster 3: mass sports focus (low ES, high MS – 8 countries: BE, ES, CY, DE, FR, IE, LU, UK),
- Cluster 4: high sporting performance (high ES, high MS – 5 countries: DK, FI, NE, SI, SE).

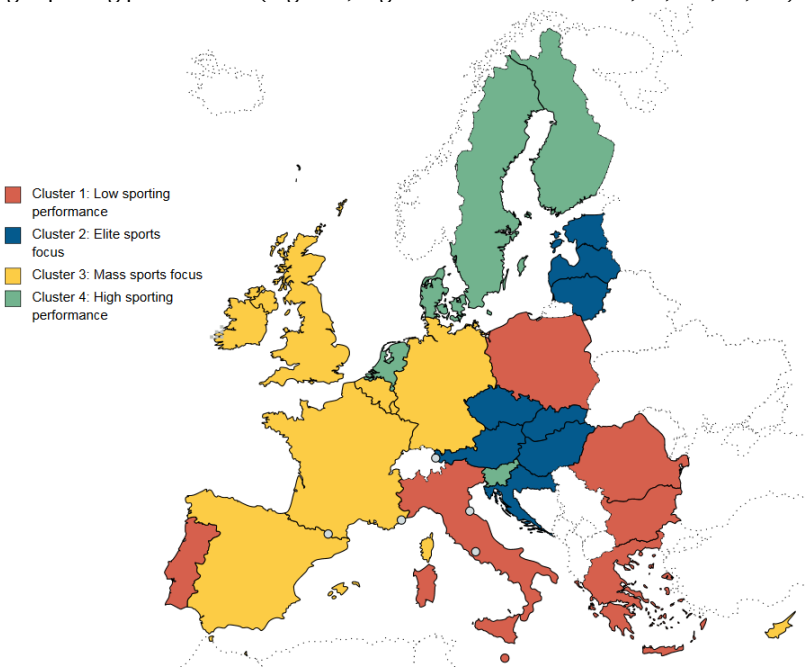

Figure 2. General clusters of the EU countries based on their performance in mass and elite sports

The exploration of some potential explanations of the observed clustering (Figure3) shows differences in all profiling variables but one: DEP. Clusters with high mass sports participation (Cluster 3 and Cluster 4) register higher standard of living (as measured by GDI and iHDI) compared to Cluster 1 and Cluster 2. They also have considerably higher household spending on sports (HSE), and slightly higher public spending on sports (PSE). As a result, they have better sporting opportunities (SO) as well. On the other hand, the clusters of high elite sports performance (Cluster 2 and Cluster 4), compared to the countries of their income level (Cluster 1 and Cluster 3, respectively), have higher public spending on sports (PSE) and better sporting opportunities (SO).

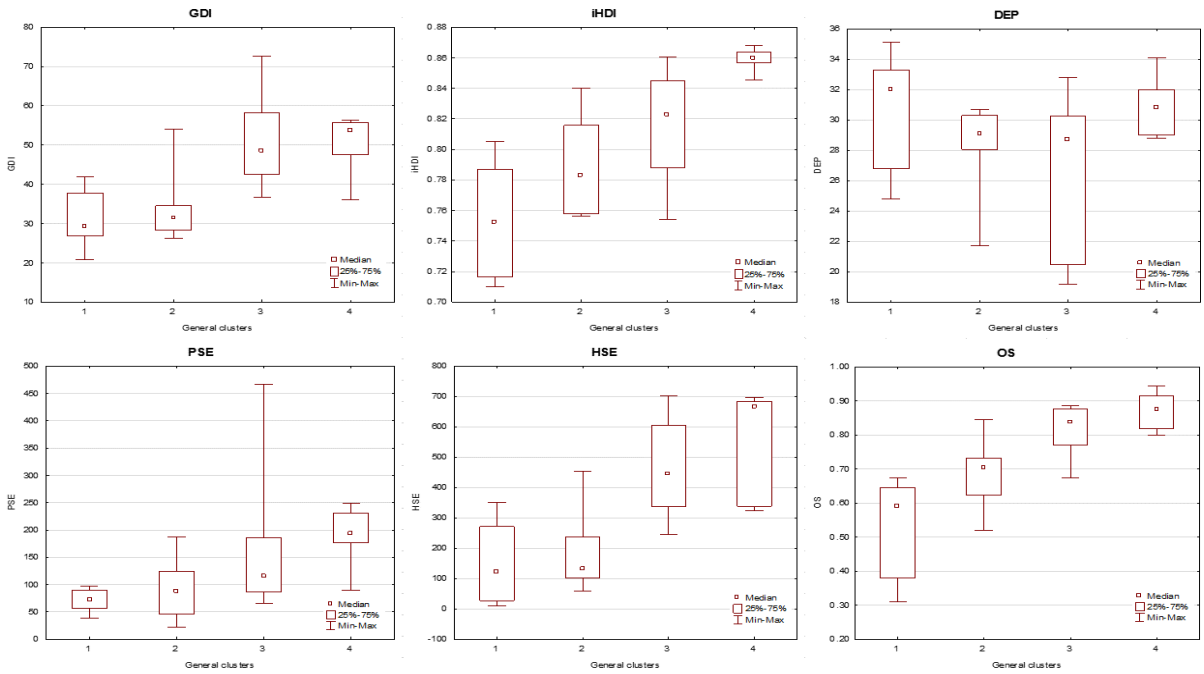

Figure 3. General clusters of the EU countries – profiling variables

Taken together, clustering process and the profiling of the general clusters lead to determination of the following groups:

1) Cluster 1: Low sporting performance – countries with both mass and elite sports achievement below the EU averages and comprised mainly of southern countries and some post-socialist ones (Bulgaria, Greece, Italy, Malta, Poland, Portugal, Romania). These are countries of relatively lower living standards, with lower public and household spending on sports, and weakest sporting opportunities among all 28 EU members.
2) Cluster 2: Elite sports focus – countries with relatively low mass sports participation but clearly better elite sports performance, mainly former socialist ones (Austria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Slovakia). With the exception of Austria, these are also countries of lower standard of living (although their iHDI is slightly better than in the case of Cluster 1). Their main difference compared to countries of Cluster 1 is better sporting opportunities, which may be due to the higher public spending on sports (as some of these countries spend more public money on sport than in Cluster 1, while the private spending sport is roughly the same in these clusters).
3) Cluster 2: Mass sports focus – countries with below the EU average elite sports performance but with above the EU average mass sports participation, mainly in Western Europe (Belgium, France, Germany, Ireland, Luxembourg, Spain, the United Kingdom). These are higher income and standard of living countries (although with some heterogeneity). Their mass sports success seems mainly correlated to the relatively high private spending on sport and in a lesser extent to the public expenditure (with the exception of Luxemburg). Consequently, the sporting opportunities for society are clearly better than in the previous two clusters.
4) Cluster 4: High sporting performance – countries with an outstanding physical activity of the nation, but also usually good Olympic results, mainly in Northern Europe (Denmark, Finland, Netherlands, Slovenia, Sweden). These countries are equally rich as those in Cluster 3, but enjoy a better and more homogenous standard of living. They also have slightly better sporting opportunities and household spending on sports, but the difference is most important in terms of public spending, which is clearly higher than in Cluster 3.

These general clusters are, in some periods, completed by an additional, unstable one:

5) Cluster 5: Outstanding elite sport performance – countries that, in some periods, manage to achieve exceptional Olympic results (at different levels of mass sports participation). The cluster contained Austria and Estonia in 2004/2006, Slovenia in 2008/10 and 2012/14, and was empty in 2016/18.

Additional observation of the clustering in each time period (Figure 1) indicates that, although many different configurations of combined mass and elite sports performance in the EU during the four time periods are registered, three clear gaps are visible. First, there are no countries with outstanding MS success and very

low ES performance – suggesting that a very high level of mass sports participation eventually brings about some elite sports success. Secondly, there are no countries with outstanding ES and very low MS – suggesting that a great success in elite sports requires a decent level of mass sports participation. Finally, there are no countries with both outstanding mass and elite sport performance, which may indicate a kind of a production frontier, and the subsidiarity of both forms of sport at their very high level. In total, these observations suggest a nonlinear relationship between mass and elite sports development.

Finally, the coefficients of variation in Table 1 as well as the visual observation of the individual countries' movements in Figure 1 show that there is more variablity in elite sports than in mass sports achievements both across countries and over time.

Discussion

This analysis contributes to the comparative sport systems research by evaluating the heterogeneity of sporting performance in the 28 EU countries in terms of the twin sport policy goals: enhanced mass sports participation and elite sports performance. Whereas the issues of complementarity versus rivalry of both sport policy goals and changing prioritising of these goals have been raised by some researchers, it is done usually in national, often historic, context (M. Green, 2009). The cross-country studies in this area are less common and usually focused on only few nations, often from a regional perspective (Ronglan, 2015)– with a notable exception of VOCASPORT and SPLISS studies (De Bosscher et al., 2015; Henry, 2009). On the other hand, comparative studies for the EU countries on both sports outcomes separately are abundant (De Bosscher et al., 2015; Grix et al., 2018; van Tuyckom, 2013). To the best of the author's knowledge, this research is the first to define the homogenous groups of the EU members in terms of both mass and elite sports simultaneously.

The four main general clusters seem quite stable in terms of their composition and average performance. The fifth cluster, of the outstanding elite sports results, appears when a country from other clusters manages to earn exceptional Olympic results in some periods. However, this Olympic overperformance seems hard to sustain – asseen in the case of Slovenia, which made up this cluster in 2008/2010 and 2012/14, but, in 2016/18, eventually returned to a lower, closer to the European average level of Olympic success (albeit still one of the highest in the EU). Clearly, the elite sports success is more volatile than the mass sports participation of the nation. Moreover, the outstanding Olympic results happened only to countries not having the highest mass sports performance, which may indicate a trade-off between an outstanding, but hazardous, Olympic success and even higher, but stable, mass sports participation. In this regard, the case of Sweden is worth further observation – this country has always registered a very high mass sports participation and relatively good elite sports results. The latter have improved even more in the latest time period. Will the country manage to increase its Olympic success even further?

The differences among the four general clusters in terms of their mass and elite sports performance match logically their differences in terms of economic income and living standard on one hand, and sporting opportunities as well as public and household expenditure, on the other. In particular, the mass sports participation is higher in clusters with relatively superior living standards and income, better sporting opportunities, higher public sport expenditure, and – importantly – higher household spending on sports. In contrast, higher elite success requires not only good sporting opportunities, but is also dependent on public financial support. These secondary results of this study are confirmed by previous research on sports participation (Dallmeyer et al., 2018; Downward et al., 2014) and Olympic success (Blais-Morisset et al., 2015; Forrest et al., 2010; Li et al., 2009) separately. As such, the profiling results assure the validity of the clustering outcomes. In contrast, the ageing of the population doesn't differ with the clusters, even though it is well-documented that individuals decrease their sports participation with age (European Commission, 2018). This may be due to the relatively small differences in this term among the EU countries (a low coefficient of variance in Table 1).

The study offers some implications for sport policy and further research. The cross-country comparison allows for benchmarking and peer learning for sport policy administrators at the national and the EU level. Concerning the EU level, the observed important heterogeneity among member countries calls for flexibility in the emergent EU sport policy. On the national policy level, the study confirms that it is hard to achieve an outstanding elite sports success without a decent mass sports participation. And even if a high Olympic result was in rare cases registered at relatively low European mass sports participation rate (Croatia in 2016/10 or Hungary in 2004/06), one also has to remember that even low mass sports participation levels in the EU are higher than in many other countries of world. Moreover, there seems to be a trade-off between both outputs at their very high levels. At their lower levels the trade-off doesn't hold as incremental changes happen in all directions.

Regarding further research, the study provides a useful context for further comparative analysis that should cover countries of similar sports outputs, i.e. in the same clusters. Issues for future work include, i.a., further exploration of variables influencing the observed heterogeneity with the focus on factors under control of public policy. Another interesting issue is the future path of the post-socialist countries currently in Cluster 2 (sports) – will they move towards Cluster 3 (sports) or towards Cluster 4 (high sporting performance) with their economic caching up on the richer EU countries?

The main limitation of the study is the measure of elite sports success, which is based solely on Olympic medals. A future research could modify this measurement to include also other top sporting contests, e.g., World or European championships.

Conclusion

The originality of the study consists of the segmentation of the EU countries in terms of both sport policy goals simultaneously.

The main results revealed a clear and relatively stable heterogeneity of the EU countries in terms of their performance in mass and elite sports. In particular, the analysis allowed for delimitation of four stable clusters (low sporting performance, elite sports focus, mass sports focus, and high sporting performance) with the additional, unsteady one of outstanding elite sport performance. These segmentation outputs were validated through the profiling of the clusters in terms of some sport policy-related correlates. Additionally, the study found more variance in elite sports than in mass sports achievements, both across countries and over time.

These findings have some theoretical contributions as the delimited clusters create a context for futher research in comparative sport policy studies. Moreover, the study offers some practical implications for sport policy bench learning and design at the national and European level. Taken together, the results of the study add to our understanding of sporting differences in Europe, shaped not only by cultural, geographical, and historical factors, but also by economic developments and national sport policy choices.

References

Blais-Morisset, P., Boucher, V., & Fortin, B. (2015). L'impact des dépenses publiques en sport sur les médailles olympiques: une analyse économétrique. *(CIRANO Working Papers 2015s-39). CIRANO.* https://ideas.repec.org/p/cir/cirwor/2015s-39.html

Christiansen, N. V., Kahlmeier, S., & Racioppi, F. (2014). Sport promotion policies in the European Union: Results of a contents analysis. *Scandinavian Journal of Medicine and Science in Sports*, *24*(2), 428–438.

Collins, D., Bailey, R., Ford, P. a., MacNamara, Á., Toms, M., & Pearce, G. (2012). Three worlds: New directions in participant development in sport and physical activity. *Sport, Education and Society*, *17*(2), 225–243.

Crosnoe, R. (2002). Academic and health-related trajectories in adolescence: The intersection of gender and athletics. *Journal of Health and Social Behavior*, *43*(3), 317–335.

Dallmeyer, S., Wicker, P., & Breuer, C. (2018). The relationship between sport-related government spending and sport and exercise participation: the role of funding size, period, and consistency. *International Journal of Health Promotion and Education*, *56*(4–5), 237–247.

De Bosscher, V., Bingham, J., Shibli, S., van Bottenburg, M., & de Knop, P. (2008). *The global sporting arms race: An international comparative study on sports policy factors leading to international sporting success*. Meyer & Meyer Sport (UK) Ltd.

De Bosscher, V., Shibli, S., Westerbeek, H., & van Bottenburg, M. (2015). *Successful elite sport policies. An international comparison of the sport policy factors leading to international sporting success (SPLISS 2.0) in 15 nations*. Meyer & Meyer Sport (UK) Ltd.

De Bosscher, V., Shilbury, D., Theeboom, M., Van Hoecke, J., & de Knop, P. (2011). Effectiveness of national elite sport policies: A multidimensional approach applied to the case of Flanders. *European Sport Management Quarterly*, *11*(2), 115–141.

De Bosscher, V., Sotiriadou, P., & van Bottenburg, M. (2013). Scrutinizing the sport pyramid metaphor: An examination of the relationship between elite success and mass participation in Flanders. *International Journal of Sport Policy and Politics*, *5*(3), 319–339.

Downward, P., Lera-López, F., & Rasciute, S. (2014). The correlates of sports participation in Europe. *European Journal of Sport Scienceport Science*, *14*(6), 592–602.

European Commission. (2004). *Special Eurobarometer 213: The citizens of the European Union and sport* (Issue November Wave 62.0). TNS Opinion [producer].

European Commission. (2010). Special Eurobarometer 334: Sport and physical activity (Wave 72.3). TNS Opinion [producer].

European Commission. (2014). Special Eurobarometer 412: Sport and physical activity (Issue March Wave EB80.2). TNS Opinion [producer].

European Commission. (2018). Special Eurobarometer 472: Sport and physical activity (March 2018 Wave EB88.4). TNS Opinion [producer].

Eurostat. (2019a). General government expenditure by function (COFOG) (Version 2019-03-05) [Data set]. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=gov_10a_exp&lang=en

Eurostat. (2019b). Mean consumption expenditure of private households on sporting goods and services by COICOP consumption purpose (Version 2018-11-05) [Data set]. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=sprt_pcs_hbs&lang=en

Eurostat. (2019c). Population on 1 January by age and sex. (Version 2019-02-28) [Data set]. https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=demo_pjan&lang=en

Feddersen, A., Jacobsen, S., & Maennig, W. (2009). Sports heroes and mass sports participation – the (double) paradox of the "German tennis boom". *Hamburg Contemporary Economic Discussions*, *29*.

Forrest, D., Sanz, I., & Tena, J. D. (2010). Forecasting national team medal totals at the Summer Olympic Games. *International Journal of Forecasting*, *26*(3), 576–588.

Frawley, S., & Cush, A. (2011). Major sport events and participation legacy: The case of the 2003 Rugby World Cup. *Managing Leisure*, *16*(1), 65–76.

Frick, B., & Wicker, P. (2015). The trickle-down effect: how elite sporting success affects amateur participation in German football. *Applied Economics Letters*, *23*(4), 259–263.

García, B., de Wolff, M., & Yilmaz, S. (2018). Issue framing and institutional constraints in EU agenda-setting: An analysis of European Union sport policy. *Journal of Contemporary European Research*, *14*(1), 23–39.

Green, B. C. (2005). Building sport programs to optimize athlete recruitment, retention, and transition: Toward a normative theory of sport development. *Journal of Sport Management*, *19*(3), 233–253.

Green, M. (2009). Podium or participation? Analysing policy priorities under changing modes of sport governance in the United Kingdom. *International Journal of Sport Policy*, *1*(2), 121–144.

Grix, J., & Carmichael, F. (2012). Why do governments invest in elite sport? A polemic. *International Journal of Sport Policy and Politics*, *4*(1), 73–90.

Grix, J., Lindsey, I., De Bosscher, V., & Bloyce, D. (2018). Theory and methods in sport policy and politics research. *International Journal of Sport Policy and Politics*, *10*(4), 615–620.

Hanstad, D. V., & Skille, E. Å. (2010). Does elite sport develop mass sport? *Scandinavian Sport Studies Forum*, *1*, 51–68.

Henry, I. (2009). European models of sport: governance, organisational change and sports policy in the EU. *Hitotsubashi Journal of Arts and Sciences*, *50*(1), 41–52.

Houlihan, B. (1997). *Sport, policy and politics: A comparative analysis*. Routledge.

Houlihan, B., & Green, M. (2008). Comparative elite sport development. In *Comparative Elite Sport Development: systems, structures and public policy* (pp. 1–25). Elsevier Ltd.

Houlihan, B., & White, A. (2002). *The politics of sports development: Development of sport or development through sport?* Psychology Press.

Li, H., Meng, L., & Wang, Q. (2009). The government's role in China's Olympic glory. *Applied Economics*, *41*(25), 3313–3318.

Nessel, K., & Kościółek, S. (2020). The total sporting arms race: benchmarking the efficiency of public expenditure on sports in EU countries. *European Sport Management Quarterly*, Advance online publication. https://doi.org/10.1080/16184742.2020.1833956

Oakley, B., & Green, M. (2001). Still playing the game at arm's length? The selective re-investment in British sport, 1995–2000. *Managing Leisure*, *6*(2), 74–94.

Ronglan, L. T. (2015). Elite sport in Scandinavian welfare states: legitimacy under pressure? *International Journal of Sport Policy and Politics*, *7*(3), 345–363.

Scelles, N., Andreff, W., Bonnal, L., Andreff, M., & Favard, P. (2020). Forecasting national medal totals at the Summer Olympic Games reconsidered. *Social Science Quarterly*, *101*(2), 697–711.

Sjöblom, P., & Fahlén, J. (2010). The survival of the fittest: Intensification, totalization and homogenization in Swedish competitive sport. *Sport in Society*, *13*(4), 704–717.

UNDP. (2021). *Human Development Data Center* [Data set].http://hdr.undp.org/en/data

van Bottenburg, M. (2002). Sport for all and elite sport: do they benefit one another ? *IX World Sport for All Congress*, *October*, 27–30.

van Tuyckom, C. (2013). Six sporting worlds. A cluster analysis of sports participation in the EU-25. *Quality and Quantity*, *47*(1), 441–453.

Veal, A. J., Toohey, K., & Frawley, S. (2012). The sport participation legacy of the Sydney 2000 Olympic Games and other international sporting events hosted in Australia. *Journal of Policy Research in Tourism Leisure and Events*, *4*(2), 155–184.

Weed, M., Coren, E., Fiore, J., Wellard, I., Chatziefstathiou, D., Mansfield, L., & Dowse, S. (2015). The Olympic Games and raising sport participation: A systematic review of evidence and an interrogation of policy for a demonstration effect. *European Sport Management Quarterly*, *15*(2), 195–226.

World Bank. (2019). *World Development Indicators* [Data set]. https://databank.worldbank.org/source/world-development-indicators